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ABSTRACT

It was hypothesized that individual differences in observer attitudes might affect the way observers code teacher behavior. A questionnaire assessing educational attitudes was given to 22 subjects who were trained on 3 classroom observation systems: the Flanders Interaction Analysis, the Classroom Observation Scales, and the Classroom Observation Record. Subjects viewed videotapes of eight teachers and then rated each teacher on a Post-Coding Questionnaire. The questionnaire requested responses on a seven-point scale to the following items: (1) How well did you like the teacher? (2) How well did the teacher present the subject matter? (3) How well did the teacher interact with the students? and (4) How well did the students interact with the teacher? Correlations with these four factors found for the attitude survey confirmed the study hypothesis. It is suggested that observers perceive an effective teacher via general impressions, and that codings indirectly indicate these perceptions. Tables and references are included. (JD)

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Measuring Attitudes that Bias Teacher Observation

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Technical Report No. 5068

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ABSTRACT

An experiment was conducted to investigate the effect of observer attitudes on coding. A questionnaire assessing educational attitudes was constructed, factor analyzed, and given to 22 subjects who were subsequently trained on three classroom observation systems--the Flanders Interaction Analysis, the Classroom Observation Scales, and the Classroom Observation Record. Subjects viewed videotapes of eight teachers and then rated each teacher on a Post-Coding Questionnaire (PCQ). Their responses to the attitude survey were then correlated with their codings and PCQ ratings. Systematic effects were obtained for all four factors on the questionnaire.

Measuring Attitudes that Bias Teacher Observation

The impact of teachers on students' learning has been the focus of considerable research. Medley (1978) has recently compiled a series of what he terms "dependable findings" which describe effective teachers. He based these on a review of 289 empirical studies of teacher effectiveness. In all of these studies the scores from one or more observation systems were correlated with various measures of achievement and affect. In describing the effective teacher, Medley notes that some of the characteristics are the opposite of what teacher educators have been training teachers to do. For example, the teachers that achieved the best results were those who spent more time in large group instruction instead of small groups or individualized instruction.

Not everyone would agree that the findings Medley reports are counterintuitive. In fact, there are probably many who would agree with most of them. In other words, one person's "new idea" is another's "old stuff." Given the variety of attitudes held about teaching by both professionals and laymen alike, a logical question to raise is whether those attitudes could affect the perception of teaching. If this were true, then an observer's attitude might influence his or her coding of classroom behavior. Two studies of observer training by Malitz (Note 1) have shown that attitude was an important factor in predicting coding performance. The best predictor of later coder reliability in these studies was performance during training; but an attitude questionnaire had almost as large a correlation with reliability. A possible explanation for the latter correlation is that coders scoring high on the scale share similar

beliefs or biases about teaching which affects their coding in the same way. On the other hand, these coders might have a better attitude toward the task and thus learn the system better.

A direct test of the biasing effect of attitudes was made by having coders with various attitudes observe and code the same teacher. The attitudes were measured with the same 40-item set that had predicted reliability in the Malitz studies. Twenty-five of the items came from the Minnesota Teacher Attitude Inventory (MTAI) (Cook, Leeds, & Callis, 1951) while the remaining 15 were added to assess attitudes about teaching style, classroom organization, and pupil role. Several of these latter items were brief statements of process-product research findings. The items were first given to a large number of individuals and then factor analyzed into four scales. These scales were then used to correlate with the codings of observers who rated videotapes with low- or high-inference coding systems as part of another study.

METHOD

Coder Attitude Scales (CAS)

Subjects. The 40-item attitude questionnaire was administered to 384 students taking an introductory psychology course who participated to satisfy a course requirement. The questionnaires were given in groups of 30 to 50 subjects.

Analysis. All items were scored on a five-point scale with end points "strongly disagree" to "strongly agree." The direction of scoring of each item was selected so that all items were positively related. From the original forty, a set of 23 that yielded good reliability and a reasonable factor structure were selected. The

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resultant four-factor solution using a varimax rotation is shown in Table 1. The actual scales for the Coder Attitude Survey were formed by putting each item into the scale on which it had the highest loading. The scale scores were simply the sum of the ratings for those items loading on the factor after appropriate reversals had been made.

Coder Bias Experiment

Subjects. The full 40-item attitude questionnaire was administered to 24 paid volunteers before they recieved training on one or more teacher observation systems. The questionnaire was part of the initial information package given to the coders.

Design. The coders were separated into three groups of eight for training. The first group received seven hours of training on the Flanders System of Interaction Analysis (FSIA) (Flanders, 1971). The second group received three hours of training on the Classroom Observation Scales (COS) (Note 2) and the Classroom Observation Record (COR) (Ryans, 1960). The coders in group three received the full training in all three systems. Only twenty-two coders completed the training, which left group three with only six members.

These coders were then used in an experiment to assess the effect of coding interaction and induced bias. The induced bias manipulation occurred at the end of the study, and the data from this part of the experiment was not used to test the effect of coder attitudes. Each observer coded three, ten-minute videotape segments of eight different teachers conducting fifth-grade social studies classes, for a total of 24 segments. Two additional tapes of math teachers were presented for the induced bias manipulation. These videotapes had been made as part

of a study on coping skills (Note 3). The observers coded all three segments for each teacher during a one-hour session. The FSIA was coded at three-second intervals during the segment, while the COS and COR were coded after each segment. After the third segment for each teacher the coders filled out a four-item post-coding questionnaire (PCQ). They responded to the following items on a seven-point scale:

(1) How well did you like the teacher?

(2) How well did the teacher present the subject matter?

(3) How well did the teacher interact with the students?

(4) How well did the students interact with the teacher?

This design can be conceptualized as a mixed model factorial with between-subject factor coders (14) and three within-subject factors teachers (8), scale (FSIA=10, COS=12, COR=4) and segment (3). (The segment factor was not used with the PCQ.)

Analysis. The four CAS factor scores were correlated against the coders' item scores for the FSIA and COS and the four factor scores for COR for each of the 24 ten-minute segments of each teacher. Correlations also were computed for the PCQ for each of the eight teachers. In this analysis the data from coders using the same system in different groups was pooled.

Because there were so many more correlations calculated than there were coders, care had to be exercised to avoid attaching significance to isolated findings. Only those items with a large number of significant correlations ($p<.10$) were interpreted. A large number in this case was defined by using a modification of the [illegible] test (Bradley 1968) for the correlation matrices. Since a significant correlation was defined by a probability level of

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$p<.10$, it was assumed that the distribution of chance correlations would show a binomial distribution with $p=.1$ and $q=.9$. Cutoff values for the number of correlations involved in each cell and factor of the design were computed with an extended precision FORTRAN routine. For example, each FSIA item involved 8 teachers X 3 segments for a total of 24 correlations and of these 24 there would be five or more significant at the $p<.10$ level only ten percent of the time if the data were random. The number of significant correlations, their signs, and the cutoff values are shown in Table 3. An instrument was considered for further interpretation only if the total number of significant correlations with it exceeded the number expected by chance. An individual item was considered significant for FSIA, COS or COR if the absolute value of the number of positive correlations minus the number of negative correlations exceeded the cutoff value for an N of 24. For the PCQ an N of eight was used since it was given only once for each teacher. A summary of the items showing a significant number of significant correlations along with a description of the item is shown in Table 4.

RESULTS AND DISCUSSION

CAS 1--Teacher Responsiveness. Coders scoring high on this variable agreed with statements emphasizing the amount of attention a teacher paid to the conduct of instruction. They valued creative approaches to teaching, attention to individual differences, responding to students, understanding students, involving all students, and using positive reinforcement. All four instruments showed a significant number of correlations with this factor. There were a significant number of negative correlations with all of the FSIA categories.

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Coders high on this scale saw less praise, student initiated talk, and silence or confusion, while they saw more questioning and lecturing. Examination of the COS correlations showed those scoring high on this factor gave lower ratings for higher level pupil cognitive behavior and for convergent and evaluative teacher behavior. There was also a tendency to rate teachers lower on the COR but it appeared consistently only for the systematic-organized variable. The PCQ showed mostly negative correlations with the item "teacher interacts well with students" being rated lower by those high on this variable. Teacher Responsiveness was the strongest factor in the CAS, accounting for 60 percent of the variance. Those high on it favored a varied teaching style oriented toward the student, but scored teachers lower on such behaviors. Instead, at least for the FSIA, they saw more traditional, one-way teacher behavior.

CAS 2--Pupil ability. Observers high on this scale tended to agree with statements reflecting positively on the ability of students. They pictured students as mature, able to think for themselves, considerate of teachers, and able to make decisions. Three of the four scales showed significant numbers of correlations with pupil related items, with the COR being the sole exception. As might be expected, most of the relationships involved items related to interaction with pupils. Three items had significant correlations with FSIA. There was a positive relationship with the total scale, and coders high on the scale rated teachers as using more student ideas and giving more directions. Conversely, coders rated teachers as asking fewer questions. COS coders high on this factor rated some teachers higher on pupil attention. Similarly, teachers were rated

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high on interacting with students on the PCQ. If one considers the teacher asking questions as interfering with his or her interaction with students, then a consistent pattern emerges for this factor which accounts for 22 percent of the CAS variance. When compared with other coders, those high on this factor favor giving the student a greater role in the classroom and tend to see teachers allowing more student participation.

CAS 3--Attitude toward school. This factor is related to a strong reaction to a series of negative statements about teachers, students and schools. Those scoring high on this scale saw teachers as well qualified, students as interested in school, students as enjoying school, and students as able to carry out instructions. All of the relationships with coding systems were positive, with only the PCQ lacking a significant number of correlations. The only FSIA relationship was with teacher asking questions. There were a significant number of positive relationships with the overall COS scores. Coders high on this rated teachers higher on pupil-to-pupil interaction and on higher cognitive level pupil behavior. They saw the teachers as clearer and more task-oriented. On the COR there was a positive relationship with the total number of correlations as well as all three teacher scales: kindly-understanding, systematic-organized, and stimulating-imaginative. The CAS factor Attitude Toward School was not a large one, accounting for only eleven percent of the factor variance. It did show, however, a consistent pattern of coding related to the scale. Those high on this scale saw a better climate in the classroom with both teacher and students operating in a positive manner. This may indicate the scale relates

to a socially desirable view of the classroom.

CAS 4--Teacher Quality. The fourth and smallest CAS factor relates to a series of statements similar to those found on many teacher evaluations. Most of these have to do with effective teacher organization, including consistency in dealing with pupils, well-designed lessons, well-organized classrooms, and control over the class. It also included a neat personal appearance for the teacher. Those scoring high on this scale showed a significant number of negative correlations with the FSIA items. Those with high scores saw less praise or encouragement, lecturing, giving directions, and student-initiated talk. There was also a significant number of negative relationships in the PCQ, but no particular item was significant. In contrast, the COS showed more higher level cognitive pupil behavior for high scores, which appears to be in contradiction to the negative relationship on FSIA for student-initiated talk. This factor has a clear set of defining items, but accounted for only eight percent of the variance. It may be that those high on this are more critical of what they consider appropriate examples of the four FSIA categories.

CONCLUSIONS

The hypothesis tested in this experiment was that individual differences in the attitudes of observers might affect the way they code teacher behavior. Correlations with the four factors found for the attitude survey confirmed that this was the case. Attitudes related to teacher responsiveness showed positive correlations with a direct teacher style and negative correlations to the teacher allowing student participation. The student ability and attitude toward school

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factors showed positive correlations with student related coding items. The fourth factor, teacher quality, showed negative correlations with several FSIA scales which did not clearly relate to one another. The small number of raters compared with the number of correlations computed suggests caution should be observed in generalizing these findings. Nevertheless, there was clear evidence for some coding categories being strongly influenced by the coders' attitudes.

These results are particularly interesting because the pattern of correlations between coders' attitudes and ratings of teacher behavior are strikingly similar to the relationships of the teacher behaviors to student achievement. In his paper, Medley (1978) lists the teacher behaviors related to effective instruction for low socio-economic status pupils in the primary grades. The effective teacher was described as being more direct, using more praise, spending more time in task-related activity, using more large groups and involving the students less in instruction than the ineffective teacher. This was very similar to the pattern of correlations found with factor CAS 1, teacher responsiveness, with the exception of praise. The higher a person was on CAS 1 the more he or she tended to see some teachers as being more like effective teachers than did those low on the factor. No information was available about the effectiveness of the teachers shown on the videotapes, so it was not possible to tell if any of the observers were more successful in discriminating good teachers. Various ways to explain the similarity to the effective teacher behavior findings have been considered, but none has been satisfactory. One possibility is that observers perceive an effective

teacher via a general impression, and that the codings only indirectly indicate this perception. Whatever the reason, the relationship between coder attitudes and perception of teachers has strong implications for studies using teacher observation to study classrooms.

Table 1

VARIMAX Rotated Factor Matrix for
Selected Coder Attitude Items

Item	Factor 1	Factor 2	Factor 3	Factor 4
2	(.174)	(.134)	(-.107)	.314
6	.546	(.056)	(.268)	(.051)
7	.427	(.044)	(.177)	(.164)
8	(.071)	(.320)	.386	(-.153)
9	(.062)	(.045)	.343	(.079)
11	.284	(.179)	(.078)	(.213)
12	(.082)	(-.096)	(.268)	.602
14	(.185)	(.113)	(.043)	.349
16	(.130)	.605	(.266)	(-.052)
17	.302	(.186)	(.062)	(.132)
19	(.116)	(.220)	.371	(.066)
20	.411	(.230)	(-.033)	(.150)
21	(.198)	(.083)	.527	(-.058)
22	(.244)	(.097)	(.238)	.410
24	.476	(.101)	(.131)	(.238)
26	(.139)	.614	(-.027)	(.140)
28	.447	(.144)	(.122)	(.234)
30	.578	(.159)	(.084)	(.099)
31	(.137)	.512	(.298)	(-.063)
32	(.043)	(.121)	.344	(.124)
35	(.072)	.199	(.041)	(.030)
36	(.229)	(-.091)	(-.089)	.408
37	(.125)	.556	(.189)	(.080)

Factor	Eigen-value	Percent Variance	Factor Name
1	3.665	59.0	Teacher Responsiveness
2	1.357	21.8	Pupil Ability
3	.687	11.1	Attitude Toward School
4	.502	8.1	Teacher Quality

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Table 2

Items Used for the Classroom Attitude Survey (CAS)

Item	Factor	Text
1	-	Teachers should organize the class routine so that little time is lost in transition from one learning activity to another.
2	4	Effective teachers are consistent in their relationships with students.
3	-	Most of my teachers have been competent. (reversed)
4	-	Difficult disciplinary problems are seldom the fault of the teacher. (reversed)
5	-	Pupils can be very boring at times. (reversed)
6	1	A good teacher recognizes and responds to contributions of students.
7	1	Good teachers employ creative and imaginative approaches to teaching.
8	3	Most pupils are not interested in learning. (reversed)
9	3	"Those who can do, those who can't teach", is a cliche that fits most elementary teachers. (reversed)
10	-	The whims and impulsive desires of children are usually worthy of attention.
11	1	Good teachers pace their instruction to suit students' concentration and interest span.
12	4	A good teacher maintains a neat personal appearance.
13	-	Passing students to the next grade for social reasons is a good idea. (reversed)
14	4	Teachers should design lessons and units with clear, logical and sequential content.
15	-	A teacher should be able to get along with almost any child.
16	2	Children are not mature enough to make their own decisions. (reversed)
17	1	Teachers who utilize a variety of questioning strategies will have better results.
18	-	Discipline in the modern school is not as strict as it should be. (reversed)

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19	3	Children usually have a hard time following instructions. (reversed)
20	1	Teachers should communicate with students sympathetically, accurately and with understanding.
21	3	One should not expect pupils to enjoy school. (reversed)
22	4	Effective teachers give careful attention to the physical condition and appearance of the classroom.
23	-	Too many children nowadays are allowed to have their own way. (reversed)
24	1	Showing initiative and imagination is an important teacher characteristic.
25	-	The teacher should not be expected to manage a child if his or her parents are unable to do so. (reversed)
26	2	Children will think for themselves if permitted.
27	-	Grading is of value because of the competition element. (reversed)
28	1	A teacher should involve all students in learning activities.
29	-	You can't teach someone to teach--it's an inborn quality. (reversed)
30	1	Practicing positive reinforcement techniques is an important aspect of teaching.
31	2	Children are unable to reason adequately. (reversed)
32	3	Teachers should not expect pupils to like them. (reversed)
33	-	An effective teacher prepares written lesson plans.
34	-	Standards of work should vary with the pupil.
35	2	Most pupils are considerate of their teachers.
36	4	One cannot be a good teacher without having control over the classroom.
37	2	Children usually will not think for themselves. (reversed)
38	-	A teacher must treat students impartially.
39	-	An open classroom promotes learning.
40	-	There is too much emphasis on grading.

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Table 3

Summary of the Signs of Significant Correlations Between the Coder Attitude Survey (CAS) Factors and Observation System Items or Factors

Flanders' System of Interaction Analysis (FSIA)

	CAS 1		CAS 2		CAS 3		CAS 4		Category Totals		
FSIA Item	+	-	+	-	+	-	+	-	+	-	Sum
1	0	1	0	1	0	0	1	1	1	3	4
2	0	19**	0	0	0	1	1	14**	1	34**	35**
3	3	0	14**	0	0	1	2	1	19**	2	21**
4	6′	1	0	13**	7**	0	2	2	15′	16*	31**
5	7*	0	1	0	3	0	0	5′	11	5	16*
6	1	4	11**	2	3	0	0	5′	15′	11	26**
7	0	0	2	0	0	1	0	3	2	4	6
8	3	0	4	0	0	0	2	0	9	0	9
9	0	10**	4	0	3	1	0	5′	7	16*	23**
10	2	7′	0	0	0	1	2	0	4	8	12
Total	22	42**	36**	16	16	5	10	36**	84	99	
+ & -	64**		52**		21		46**				183**

Classroom Observation Scales (COS)

	CAS 1		CAS 2		CAS 3		CAS 4		Category Totals		
COS Item	+	-	+	-	+	-	+	-	+	-	Sum
1	0	4	5′	0	3	3	0	4	8	11	19**
2	1	1	2	0	4	0	0	2	7	3	10
3	0	0	0	4	6′	1	2	1	8	6	14′
4	1	1	1	0	1	0	0	0	3	1	4
5	1	0	1	3	1	1	3	1	6	5	11
6	0	1	3	1	2	1	1	0	6	3	9
7	0	10**	0	2	12**	0	6*	0	18**	12	30**
8	5	1	0	4	4	0	3	0	12	5	17*
9	0	6*	4	0	0	1	0	1	4	8	12
10	0	1	1	1	6′	1	3	0	10	3	13
11	0	1	1	0	5′	0	0	0	6	1	7
12	0	0	2	1	3	1	1	3	6	5	11
Total	8	26	20	16	47**	9	19	12	94	63	
+ & -	34		36		56**		31				157**

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Table 3: (continued)

Classroom Observation Record (COR)

	CAS 1		CAS 2		CAS 3		CAS 4		Category Totals		
COR Factor	+	-	+	-	+	-	+	-	+	-	Sum
1	0	2	1	1	5′	0	1	1	7	4	11
2	0	7**	1	0	9**	0	1	0	11	7	18**
3	3	2	0	2	9**	1	1	0	13	5	18**
4	0	3	1	1	4	0	0	1	5	5	10
Total	3	14′	3	4	27**	1	3	2	36	21	
+ & -	17*		7		28**		5				57**

Post Coding Questionnaire (PCQ)

	CAS 1		CAS 2		CAS 3		CAS 4		Category Totals		
PCQ Item	+	-	+	-	+	-	+	-	+	-	Sum
1	0	2	0	0	2	0	1	1	3	3	6′
2	0	2	2	0	1	0	1	0	4	2	6′
3	0	3*	3*	0	0	0	1	3	4	6′	10**
4	0	3*	2	0	1	0	0	2	3	5	8*
Total	0	10**	7*	0	4	0	3	6′	14	16	
+ & -	10**		7*		4		9**				30**

Notes:

′ $p<.10$

* $p<.05$

** $p<.01$

The probabilities are based on a binomial distribution ($p=.1$, $q=.9$).
The cutoff values for the various N's are tabled below:

N	p<.01	p<.05	p<.10	Remarks
8	4	3	3	PCQ cells
24	7	6	5	FSIA, COR & COS cells
32	9	7	6	PCQ rows & columns
96	18	16	14	FSIA, COR & COS columns; COR rows
130 (128)	22	20	18	PCQ total
240	36	33	31	FSIA columns
290 (288)	42	39	37	COS columns
390 (384)	54	50	48	COR total
910	117	113	109	FSIA total
1150 (1152)	140	133	129	COS total

Table 4

Observation Scale Items or Factors Which Correlate with Attitude Toward Classrooms

Item	Overall effect	CAS scales	Wording
		Flanders' System of Interaction Analysis (FSIA)	
2	-	1(-),4(-)	praises or encourages
3	+	2(+)	accepts or uses ideas of students
4	+,-	1(+),2(-),3(+)	asks questions
5	total	1(+),4(-)	lecturing
6	+	2(+),4(-)	giving directions
9	-	1(-),4(-)	student talk--initiation
10	none	1(-)	silence or confusion
all	total	1(-),2(+),4(-)	
		Classroom Observation Scales (COS)	
1	total	2(+)	pupil attention
3	total	3(+)	pupil-to-pupil interaction
7	+	1(-),3(+),4(+)	higher level cognitive pupil behavior
8	total	none	passive pupil behavior
9	none	1(-)	convergent-evaluative interaction
10	none	3(+)	task orientation
11	none	3(+)	clarity
all	total	3(+)	
		Classroom Observation Record (COR)	
1	none	3(+)	kindly-understanding
2	total	1(-),3(+)	systematic-organized
3	total	3(+)	stimulating-imaginative
all	total	1(-),3(+)	
		Post Coding Questionnaire (PCQ)	
1	total	none	liked teacher
2	total	none	teacher presented subject matter well
3	-	1(-),2(+)	teacher interacted well with students
4	total	1(-)	students interacted well with teacher
all	total	1(-),2(+),4(-)	

Notes:
none: This category was not significantly different from chance
total: Neither pluses or minuses were significant but the combined total was.

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